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ABSTRACT

This study was designed to determine if non-science majors who have a 1-hour teacher-structured review before each major test score higher than students who review by self-preparation. Four laboratory science classes in a junior college in Mississippi were randomly selected, with two classes assigned as the control group and two classes as the experimental group. Science majors and students with extreme unmatched ACT scores were excluded. Data were collected from five teacher-made tests which were given to both groups each semester and comparisons were made for three ACT groupings. These included: (1) all students; (2) students with an ACT of 15 or above; and (3) students scoring below 15 on the ACT. Results indicated that a teacher-structured review did help non-science students with low ACT scores to score significantly higher on teacher-made tests. Teacher-structured review did not improve the test scores for the total group nor for students with high ACT scores. (ML)

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EFFECTS OF A TEACHER-STRUCTURED REVIEW ON NON-SCIENCE MAJORS IN REQUIRED LABORATORY SCIENCE CLASSES

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EFFECTS OF A TEACHER-STRUCTURED REVIEW ON
NON-SCIENCE MAJORS IN REQUIRED LABORATORY SCIENCE CLASSES

Many students entering community college have a deficiency in high school science subjects and natural science. This information is borne out by American College Test Scores at East Mississippi Junior College. Yet these same students are faced with the problem of taking and making an acceptable grade in their required laboratory science courses. The following literature review discusses several factors that might aid students under these conditions but did not consider review techniques as a method. Therefore, this study will consider the following question: Will non-science majors who have a one hour teacher-structured review before each major test, score higher than students who review by self-preparation?

Literature Review

Prior studies have found several factors to be important in the science education of non-science majors. Tilford (1971) found significant differences on seven measures of academic ability and achievement between non-science and science majors. These measures were: ACT score, ACT science score, grade point average, high school science activity, and attitude toward science.

O'Banion (1972) states that typical community college students have a wide range of academic abilities and are low in self-confidence giving them a low concept of the amount of academic progress that they can make. Baker (1982) found two characteristics to be prevalent in non-science majors: a lack of positive attitude toward science and a non-scientific personality. This study stated that a non-scientific personality tended to make decisions based on personal values instead of logic.

Although Sauscer (1973) found no significant difference in the test

scores of non-science students in a lecture or a student-centered modular class, Tollefson and Nona (1979) found that students who talked to their instructors outside of class, in groups, about course concepts earned significantly higher grades than students who did not. If group activities outside of class relate to success on final examinations, could a teacher-structured review in class also aid student achievement?

Hypothesis

To structure this study, the following operational null hypothesis was offered. There is no significant difference in the mean test scores of non-science majors with a one hour teacher-structured review before each major test and non-science majors who review by self-preparation. Three comparisons were made: all students, students with an ACT above 15, and students with an ACT below 15.

Procedure

The treatment time for this study was one year and four sections of laboratory science with 26 students per class were used. Each class was taught by the lecture method and contained one teacher-structured two-hour laboratory per week. The experimental group received the following treatment. Tests were assigned two class meetings in advance with the class meeting before the test being used for a teacher-structured review. The review consisted of three parts: (1) a restatement of major points by the teacher, (2) short answer questions being presented by the teacher, and (3) time was allowed for the students to ask questions and get a teacher response if desired. The control group was also assigned their test two class meetings in advance. This group's plan followed only review procedure number three above. If the control group did not ask sufficient questions to use the entire class period, the teacher

started lecture on the next topic.

Population and Sample

The total population for this study was 206 non-science majors who were required to take two laboratory science classes. The population was located in a junior college in East-central Mississippi.

Since this study had no control over the registration of students, four classes of students were randomly selected, and two classes were assigned as the control group, and two classes were assigned as the experimental group. Nine students were eliminated from each group, science majors were excluded and students with extreme unmatched ACT scores were excluded. ACT scores have been found to be the best predictor of success at this junior college, so extreme unmatched scores on the ACT were excluded. Composite ACT scores ranging from seven to twenty-five comprised both the experimental and control groups.

Data Collection and Analysis

Data collection was from five teacher-made tests given to both experimental and control classes each semester. The tests were teacher-made tests given at various intervals based on the amount of material covered and on some student input as to the day of the test. Each test was composed of five discussion questions and from twenty to thirty short answer questions per test. The data were analyzed by use of a t test and experimental-control comparisons were made for three ACT groups: (1) all students, (2) students with an ACT of 15 or above, and (3) students scoring below 15 on the ACT. Table I presents a summary of groups and data collected.

Table I

Mean Test Scores and ACT
Scores for Experimental and Control
Groups Classified According to ACT Ranges

ACT Range	Mean ACT		Mean Test Score		t value for test scores	Critical t
	Control	Exp.	Control	Exp.		
Total (N=43)	12.1	12.0	82.3	85.0	1.35	1.99
15 and above (N=12)	18.3	18.25	92.0	91.5	.20	2.20
Below 15 (N=31)	9.7	9.7	78.5	82.6	2.03	2.00

Table I shows a significant difference in mean test scores of students with an ACT score of below 15. Experimental group students receiving a teacher-structured review scored significantly higher (.05) than did control group students. No significant difference was found between groups when the total group was compared, or when students had a 15 or higher ACT score. Based on the results of this study, the null hypothesis was rejected for students with an ACT score of below 15 and not rejected for students with a 15 and above ACT and for all students as a group.

Summary and Implications

A teacher-structured review did help non-science students with low ACT scores taking a required laboratory science class score significantly higher on teacher-made tests. As an overall group and for students with high ACT scores, a teacher-structured review did not improve their test scores. Although additional information is needed to draw further conclusions about the use of teacher-structured review, the following

implication is offered. The use of a teacher-structured review, especially with low ACT students, could possibly help the self-confidence and attitude problems presented by O'Banion (1972) and Baker (1982), and studies in these areas are recommended.

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